

substitute specification
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APPENDIX A

SUBSTITUTE SPECIFICATION

Title of the Invention

LITHIUM SECONDARY BATTERY

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Cross Reference to Related Application

This application is a continuation application of U.S. Application Serial No.09/406,592, filed September 27, 1999, the entirety of which is incorporated herein by reference.

Background of the Invention and Related Art Statement

The present invention relates to a lithium secondary battery wherein the particle shape of the positive electrode active material is controlled, thereby the resistance of the positive electrode active material and accordingly the internal resistance of the battery are made low, and resultantly discharge in large current has been made possible.

In recent years, portable type electronic appliances such as portable telephone, VTR, notebook type computer and the like have become increasingly small and light. In these portable type electronic appliances, there have come to be used, as the battery as electric source, secondary batteries wherein the active material of the positive electrode is a lithium transition metal compound oxide, the active material of the negative electrode is a carbon material, and the electrolyte solution is an organic electrolyte solution obtained by dissolving a Li ion electrolyte in an organic solvent.

Such battery is generally called lithium secondary battery or lithium ion battery. Having a large energy density and a high single-battery voltage of about 4V, lithium secondary batteries are drawing attention not only as electric sources for the above-mentioned portable type electronic appliances but also as electric sources for driving the motors of electric vehicles (EV) or hybrid electric vehicles (HEV) (wide use of EV and HEV as a vehicle low in harmful exhaust gas emission is in active investigation, in the midst of recent movement for environmental protection).

In order to drive the motor of EV or the like, a voltage of at least 100V, preferably at least 200V is essential. Meanwhile, the voltage of single lithium secondary battery is determined by